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Nuclear Test's In India: A Review And Comparative Analysis

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HISTORICAL EVOLUTION OF INDIA'S NUCLEAR PROGRAMME

India is able to test its nuclear technology in 1974 and 1998 respectively. There are several factors for the government of India to think in terms of Nuclear technology to be used for peaceful proposes. The US order to conclude the second world war dropped bombs on Hiroshima and Nagasaki in August 1945. It resulted in the Massive destruction of Material and humans. The Establishment of the United National and the constitution of the security council, India would not become a member the secrets council, instead at a later date, The People Republic of Chaina (PRC) reflex of China (PRC), become a member. The Indian Sub-continent was divided into too nations names India and Pakisthan by the British led to several skirmishes and large scale wars (1948, 1965, 1971 & 1999) and Jammu and Kashmir became a bone of contention between India and Pakishtan. The sino-Indian war of 1962, occupation of nearly 90,000 Sq.km and the occupation of aksaichin near ladak and claims over North-east and Arunachal Pradesh product by the Chinese and the friendly relations between Pakistan and to PRC, created a kind of insecurity to India in the North-West, North and North-East. India failed to secure a string support from the USSR to contain Chinees threat in 1962. By 1970, all the five permanant numbers of the security council are nuclear weapon states. The signing of the Nuclear Non-proliferation treaty in 1970, The threatened wanted of aspirations of newly emerging states to acquire nuclear technologies for peaceful purposes and to produce nuclear weapons to use such nuclear arsenal as a deterrent.

The Tata's established Sir Dorab Tata Trust in honour of Sir Dorab Tata. Dr Homi Jahangir Bhaba has submitted a proposed to the trust to start a Nuclear Research Institute in March 1944. It paved the way for the establishment of the Tata Instutite of Foundamental Research (TIFR) on 19 December 1945 Dr. Bhabha was appointed as its First Director. After independence, the Government of India passed the Atomic Energy Act on 15 April 1948. It led to the establishment of the Indian Atomic Commission (IAEC). On this occasion, Pandit Jawaharlal Nehru said that: "We must develop it for the purpose of using it peaceful purposes." Pandit Nehru being a strong advocate of Nuclear Disarmament and one of the founder of Non-aligned Movement, kept the nuclear option as an alternative in international politics, keeping in view of the possession of nuclear weapon by the US, the USSr, Great Britain, France and the Peoples Republic of China (PRC).

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Establishment of the Department of Atomic Energy (DAE), 1954:

The Government of India in-order to move to acquire nuclear weapons capability, setup the Department of Atomic Energy (DAE) on 3rd August 1954. Dr. Bhabha was appointed as it, secretary. The work on the India's First Nuclear Reactor began with British assistance in 1955 then Canade agreed to supply the 40 MW Canada India Reactor (CIR). In February 1956, the US under EisanHower President agreed to supply 21 tons of heavy water to run the reactor. The design of the Nuclear Reactor was capable to produce weapon Grade plutonium and thereby, the processed plutonium is sufficient to produce at least two bombs per year.

Development of Nuclear Weapon

The CIRUS production Nuclear Rector and the Trombay Plutonium plant began to produce the required materials to develop Nuclear Weapon. To realize the dream, Dr. Bhabha devoted his system to collect information regarding nuclear weapons. At this juncture, danger signals from the PRC appeared visible in the form of border dispute and deployment of forces on the Indian border and the near success of the PRC's nuclear weapon programme. The ignominious defeat of India in the hand, of the PRC in October – November 1962, compelled the government by the Jana Sangh Party to develop nuclear weapon. Lal Bahadur Sastri who succeeded Pandit Nehru on 2 June 1964, in line with the Gandhian view strongly opposed the nuclear weapons optional, despite the insistence to go a head with nuclear test by Bhabha there was no change in the attitude of Sastri even after the PRE conducted its Nuclear Test on 16 October 1964 on the necessity and uses of Atomic weapons, Bhabha said on 24th October 1964 thus "Atomic Weapon give a state possessing them in adequate numbers a deterrent power against attack from a much stronger state." Dr. Bhabha said that production of such weapons appear relatively cheap. Finally, Sastri has to change his 'No weapon' policy and gave the node Go ahead to Dr. Bhabha to develop Nuclear Explosion for peaceful purposes. Dr. Raja Ramanna was roped in for the purpose.

Sensing dangers from India's Nuclear programme, Mr. Ayub Khan and Zulfikar Ali Bhutto, President and Foreign Minister respectively of Pakisthan met Chou-En-Lai in march in Beijing and got Chinese support for their nuclear weapon programme.

The Pakistanis got a positive support from Beijing for it's nuclear programme. In the light of the strained relations and several unsettled issues between India and Pakisthan and Pakishtan's ambitions to snatch Jammu and Kashmir wished to arm herself with nuclear weapon to settled disputes with India. On the need of Nuclear Weapon for Pakisthan Zulfikan Bhutto Said that "India has acquired nuclear weapons, then we should have to eat grass, to get one, or buy one, of our own." During the Prime ministership of Bhutto, Pakishtan's nuclear programme got a boost. To gain upper hand militarily over the other, both India and Pakisthan began to complete with each other in conducts in Nuclear Test and stock filling the deadly weapons.

The Indio-Pak war of 1965 made it clear that the Washington – Islamabad – Beijing Axis will create security threat to India and India cannot rely on external support in the event of threat either from Pakisthan or from people's Republic of China. Pakisthan with the weapon supplied by US and the PRC's threat to India on the Tibetan border

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naturally convinced India to go for nuclear technology at this juncture Prime Minister Sastri gave his node to go ahead with development or the nuclear device.

Change in Policies

India reversed the policy adopted by Nehru by saying that unless the club of permanent Nuclear powers disarm their Nuclear weapons, India has no other option to go ahead with the nuclear weapons programme. Moreover, Nuclear weapons state are not prepared to dismantle the weapon and opposed to disarnament. So, India voted against the Nuclear Non-proliferations Treaty (NPT) on 12 June 1968. Thus, India poised the Nuclear Weapons programme and tested in device at Pokhron in 1974. Atal Behari Vajpayee has actively advocated the nuclear policy openly in the 1960. During his Prime Minister-ship the Shakti Test several war conducted in 1998 thus, India became Nuclear weapons state.

India's First Nuclear Test, 1974

With the new Prime Minister at belong of affairs. The developments in the neighbout hood also had its impact on the Indian nuclear programme. In 1967, the PRC tested its Thermo nuclear device apart from this, the Chinese Red Army moved into the disputed areas on the Sino Indian border. The new foreign secretary, Mr. P.N.Hakasal also convinced the Indian Prime Minister in this regard. Dr. Raja Ramanna was given the needed Government support to realise the nuclear dream. But, the nuclear programme was carried out in a low profile to avoid obstructions from outside world to who may deny India to have access to the row material and the nuclear technology.

Progress in Nuclear Technology

In the light of the regional and International scenario, India was determined to go ahead with its nuclear programme by 1972; the basic design for India's nuclear device was in the final stage. The required technical know how was already acquired. Mrs. Gandhi visited the Bhabha Atomic Research Centre (BARC) in connection with the tenth convocation of the Indian Institute of Technology at Bombay on 7th September 1972. As the wooden model of the proposed nuclear device was shown to the Prime Minister and the scientists at the BARC were authorised to construct the device and get ready for Testing. Dr. Sethna, Chairman, DAE took the initiative to develop nuclear explosives and missile technology.

Reactions on Nuclear Test

The success of the peaceful Nuclear explosive (PNE) was we received by the people of India. Prime Minister Indira Gandhi's popularity shot up to fame. The Jana Sangh party which constantly adovocates the nuclear explosives was happy.

The Nuclear Non-proliferation Treaty (NPT) is a direct result of the Indian Nuclear Test. The US was unhappy. The Us increased its military aid to Pakisthan. It is intended to checkmate India. Four days after the Nuclear Test, Canada stopped nuclear assistance, which resulted in the disruption of the Rajasthan-II Reactor and the Kota Heavy water plant. The Pakisthani Prime Minister Zulfikar Ali Bhutto increases the financial support to the nuclear programme.

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Mrs. Indiara Gandhi visted Pokhran on 22 December 1974 she said that India in not pursuing the Nuclear option. But, she authorised the scientist to develop a boosted fusion design.

The Allahabad High Court Judgement in June 1975 setting aside the election of Mrs. Gandhi, because of the voilation of Election code, and the subsequent proclamation of emergency and the suspension of political rights, scrapping the freedom of the press, Arrest of citizens and several other opposition leaders were arrested. In the General Elections of 1977, Mrs. Gandhi was defeated and the congress party was routed in the elections. As a result of the emergency, political crises, there was no much progress in the field of nuclear programme.

The Janatha Party Government: Nuclear Policy

Moraji Desai, being a true follower of Gahdian ideals was strong opponent of nuclear option. After, he became Prime Minister in March 1977, Opposed to peaceful Nuclear Tests.

The Nations security compelled Moraji Desai to reconsider the nuclear option keeping in view of the security situation in the west and the north. So, Moraji Desai gave a verbal support to impose upon the 1974 device. In 1978, the Government of India approved the purchase of four squadrons of Jaguar air craft from Great Britain. This air craft is suitable to fit nuclear weapon. Apart from this, 100MW plutonium production reactor at Trombay, Popularly known as 'Dhvuva' began its work. The Sovights agreed to supply 200 tonnes of heavy water to meet the short fall of heavy water by India. The Baroda heavy water plant despite the initial success fuffered on explosion and forced to close down that the Indian civilian nuclear programme has not come out of the preliminary difficulties.

Indira Gandhi Return to power and Nuclear Policy

In the 1980 General Elections, Indira Gandhi's congress (I) came to power on her return to power, She appointed Dr. Raja Ramanna as the Director of BARC. The new Director proposed to Mrs. Gandhi about his intents in to test the newly developed two weapon designs. Mrs Gandhi agreed to the proposal and in February 1981, began the work to sink two shafts at Pokhran. The work at the test site was defected by the American satellites. It was made public by Mrs. Sen Alan cramston. She also revealed that Pakistan is also doing the same Beluchistan. Yogi Agarwal also made nuclear activity of India public in August 1981. In May 1982, the Government of India has to take a decision to go ahead with the nuclear test. The Army Chief, Gen. K.V. Krishna Rao was also infavour of the nuclear option.

With Ronald Reagan of the President of the US wanted to improve the relation with India in the light of the USSR's entry with Afghanistan, Moreover, the Prime Minister of India was vary of India's vulnerability of International repercussions.

At this juncture, Mrs. Gandhi had meetings with M.R. Venkataraman, Defence Ministry, Dr. Raja Ramanna, Director, BARC, Mr. V.S. Arunachalam, Science Adviser, P.C. Alexondar, Principal secretary, and K.Rao sahib, Cobinet secretary to go ahead with

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the nuclear test. Till early 1983, Mrs. Gandhi did not approve the scientist, to Test the nuclear devise.

Despite the fact that the Joint chief of staff or the Indian armed forces in June1983, addressed to the Defence Minister in a 30 page note insisting to exercise the nuclear option, Indira Gandhi keeping in mind the international sanction rejected the request.

But under the able stewarding of Mr. Venkataraman and Arunachalam, Missile programme was continued. It is the result of the successful development of the short range Prithvi and the long range Agni missiles.

Dr. A.P.J. Abdul Kalam was shifted to the Defence Researches and Development Laboratory (DRDL) in 1982 at the instance of Raja Ramanna. An ambitious programme to develop five missiles on related technologies was endorsed by the Defence Minister. In August 1983, the instigated guided Missile Development programme (IGMOP) was supported with the requisite financial support. The concerned person at the project has anticipated the restrictions on the transfer of Missile technologies in the form of missile technology control regions which was signed in the year 1987. The Prithvi and Agni missiles were developed to carry nuclear war heads. A light weight fission bomb was permitted to manufacture and fit to the missile by the prime minister.

The developed nuclear device is to be fitted to a military fighter jet, so that the nuclear weapon can be fired at a designated place. For this jaguar was selected and tried but finally proved that jaguar unsuitable for the purpose at the same time. Raja Ramanna, keeping in view of the fast pace of Pakisthan's, uranium enrichment capability, he too initiated the uranium enrichment programme in the early years of 1980. This work was carried out at rare Minerals plant, Mysore.

The existing technical know how in India regarding the production of Heavy water has not reached the perfection stage. So, India through the middle man have to import nearly 180 tonnes of heavy water to run the nuclear installation in India.

To continue the development of uranium enriched and the fusion of nuclear technical expertise needs the conducive political environment in the counts at the stag end of the tenure of the Prime Minister Indira Gandhi, there were political disturbance at North West India and in the North East India. The political unrest in Punjab was concluded through "Operation Blue Star" and the Golden Temple was freed from the clutches of Santh Bhindranwala and others. Finally peace was restored. Indira Gandhi was assassinated on 31 October 1984. She was succeeded by her son, Mr. Rajiv Gandhi.

Mr. Rajiv Gandhi, a trained Pilot and technology Savvy Prime Minister has reluctance towards nuclear weapons, so, he was not infavour of testing nuclear weapon, nor deploy or support for the research in the refinement of Nuclear weapons. He was in favour of importing the latest technical know how from the US. If he peruse his nuclear policy of extending full cooperation to the scientist of BARC, it will jeopardise is intention to have access to the US technology.

For installation nucleation of Nuclear Policy : Rajiv Era

To formulate India nuclear policy, in informal study group was set up in November 1985. The group was composed with Admiral Tahkilioni, Navy Chief of staff, Gen. K. Sunderji, Arm Vice – Chief of staff Air Chief, John Greene, Deputy Chief of Air

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Staff, N. Raja Ramanna, director BARC, Dr. A.P.J. Abdul Kalam, Dr. Chidambaram, Director, AEC and the Sri. K. Subramnayam, Strategic Analist, It was decided to produce 70 to 100 war headed to serve as a deterrent and with a strict stipulation - no first use policy. It also suggested to hike the defence budget to meet the expenditure.

Even though no action was taken on the above technical groups recommendations by Mr. Rajiv Gandhi, he gave necessary instructions to Arunachalam to improve the existing Aircraft delivery system. Mr. Venkatesan, Director , ARDE was entrusted the job to work on the development of superior aero revision dynamic case to carry the weapon in this programme, air force was involved. The bombs produced by DRDO are weighing very high and the ground clearance was very little. So, the air force rejected to Jaguar fighter to fit with weapon because there unsuitable. Then, they switched to mirage-2000 to carry nuclear weapons finally. Mig-27 was capable to carry nuclear war heads.

The crisis in Indio-Pak Relations – 1985-1987

There were some significant issues which precipitated a crisis between India and Pakistan in late 1985. The Pakistan's nuclear build up created a war like situation between the two Nations. Mr. Rajiv Gandhi and Zia-Ul-Haq met in New Delhi in December 1985 and decided not to attack each others nuclear establishment. The fact in is that the Indian nuclear installations near located near urban centres. But the agreement between the two countries were not materialised till 31 December 1988 and not implemented till 1993. The military exercise code named Brass-tacks exercise undertaken by Indo-Pak border in July 1986, precipitated a crisis in the bilateral relation of India and Pakistan. The largest military exercise was intended to test the ability of Indian armed forces to assess the situation in the event of war between India and Pakistan. For the proposed exercise nine division of process for were deployed to Pak border in Rajasthan by the Army Chief, Gen. K. Sundarji. The propose of the exercises were not informed in advance to Pakistan. Moreover, observers were not invited to witness the exercises. It lead to suspicion in the minds of Pakistan. So, they too mobilized the armed forces to the Indias's border. The suspicious was that in the mask of military exercise, it not led to a full scale war. The problem of suspicion intensified due to lack of communication and the decision of the Indian Prime minister to air lift troops to Punjab.

As a sequel to Indians military Manoeuvres Pakistan too mobilized its armed forces so close to the Indian border, capable to strike at Indian Punjab or Kashmir. Pakisthan suspected that the Indian military movements may be a mask for full scale war. The volatile attitude of Mr. Rajiv Gandhi precipitated a crisis that India was on the shrink of war on 18 January 1987. Indian troops were Air shifted to Punjab. The danger signals of war was realized and both the parties tried to reduce tension and by 4th February 1987, normal was restore but A.Q. Khan was eager to use the opting of nuclear weapon to settle outstanding disputes between the two nations. India in nuclear power programme suffered a jolt due to the sanctions imposed on India after the nuclear test on 1974 and the 1987 crisis in the bilateral relations of India and Pakistan.

To overcome the difficulty, India resorted to import nuclear reactor from USSR and operate them under the supervision of IAEA. It was not favoured by the weapon

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establishment in India. After Ramanna's retirement M.R. Srinivasan was appointed as Director of BARC.

There were certain border skirmishes between India and the PRC. In 1986, the North east frontier agency – Arunachal Pradesh – was made – full-fledged state in the Indian Union. Naturally China protested it led to large scale deployment force on the both sides of the border. India began armed exercises. Finally, both the parties redused there forces and subsided the tension. Now, Pakisthan's nuclear threat, threatens Indian psyche than the Chinese.

Political changes in Afghanisthan and Pakistan

The political changes of Afganisthana and Pakistan and the attitude of the USSR and the US had its repercussions on the trilateral relation namely, Pakisthan, India and the PRC. It altered the strategic environment in the Indian subcontinent. The USSR after a decade long prolonged deep involvement in the Afghanistan affairs decided to with draw in February 1988. In a strange and suspected blast of military aircraft in which the President of Pakistan, Zia-Ul-Haq died. After the death of Zia, democracy was restored in Pakistan with in three months. Benazir Bhutto became Prime Minister of Pakistan is November 1988. For almost a decade, the nuclear weapon complex was under the total control of the military. Pakisthan was in a position to manufacturer fissile cores for nuclear weapons. The status of Pak nuclear programme was not known to the new Prime Minister of Pakistan.

Nuclear Tests of 1998

As stated earlier, the Janasangh Party was a strong advocate of nuclear weapons. The B.J.P., the forerunner of Janasangh since it is inception continued its pro-nuclear policy. A.B. Vajpayee, who was in power in May 1996 for 13 days wanted to test the nuclear device but deferred it because, he could not prove his majority in the Lok Sabha but in March 1998, the BJP with 13 parties formed a coalition Government and Vajpayee declared "there is no compromise national security. We will exercise all options including nuclear options to protect security and soverensity." The new BJP Government intended to "revaluate the nuclear policy and exercise the option to induct nuclear weapon."

In the light of the pronounced Policies of the BJP, it is evident that with a stable government, it will pursue its pro-nuclear policy. The US intelligence also through its satellite was able to collect data on the hectic activity at the test site. Vajpayee met Abdul Kalam and the Chairman of AEC and asked them to get ready for the tests. The new government proved its majority on 28 March 1998. The Prime Minister met Kalam and Chidambaram on 9 April to know the feasibility of conducting tests. He asked them to coordinate with Brajesh Mishra to fix the date for nuclear Tests. The tentative was arrived at 11 May. But before that Pakistan tested it's the Ghauvi Missile on 6 April with a range of 1500 Km. The strategic challenge posed by Pakistan strengthen India's determination to test its nuclear device. Dr. Abdul Quadir Khan, the architect of Pakistan's nuclear weapons programme said that they were ready since 1978 to test the device and waiting for governments permission.

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In tune with the government policies, on 4 May the Defence Minister Gearge Fernandes said thus, "My views have not changed after I became defence minister. I agree with our decision not to sign the CTBT or NPT. We should not only keep the nuclear option open, but also think about exercising this option to make nuclear weapons on 6 May Fernandez said the China was India's "Potential enemy number one: He said that China had stationed nuclear weapons on Indian border. The views of the Defence Minister on nuclear weapons and fixing the PRC as number one enemy to India, made it clear that India needs the nuclear technology to project India form nuclear weapon enemy's and to use it as a deterrent. In a way it was a warning to the PRC and Pakistan.

On 11 May 1998, India had successfully detonated. Three thermo nuclear devices with Kiloton range at Pokhran in Thar Desert near Indo Pakistan border. Now India declared its self as a full-pledged nuclear armed state.

On this Vajpayee declared thus "I have on announcement to make: Today at 3.45 PM India conducted three underground nuclear tests in the Pokhran range (in Rajasthan state). These were contained explosion like the experiment conducted in may 1974". He congratulated the scientists those who were instrumental in carrying out side tests.

In 1974, it was claimed the tests were peaceful in nature. But, the 1998 tests were claimed that they were military in nature by Brejesh Mishra, principal secretary to PM Vajpayee. He said: "These tests have established that India has a proven capability for a weaponized nuclear programme.

On 13 May another two tests with sub-kilotom nuclear devises were tested underground. Thus, five tests were successfully tested and named as "operation Shakti - 1998" The technical aspects of the nuclear tests were briefed by Dr. Kalam, DRDO and Dr. R. Chidambaram, AEC and the DAE. The different sizes of the devices are intended either to use them as artillery shell or dropped by a combat air craft. The data of the nuclear tests help the scientists to predict the exact yield of the nuclear as devices, this is necessary if the nuclear powers tried to impose ban on the nuclear tests in future. The nuclear powers have reached this stage where the nuclear tests can be carried out in laboratories. India had not reached such a stage. Now it is easily for India to conduct tests in laboratories.

Reaction to Nuclear Tests

Pakistan reacted very sharply on Indian nuclear tests. Ayub, foreign Minister of Pakistan said: "We in Pakistan will maintain a balance with India in all fields…. We are in a headlong arms race on the subcontinent". He further said that the responsibility for dealing a death blow to the global effects at nuclear non proliferation rests squarely with India. He said that Pakistan would also conduct a nuclear test off its own habitual former head of Pakistan's secret services that we have now to show that we have a counter reaction bomb.

On the impact of Indian nuclear test on Muslim world he said that all the Muslim countries are vulnerable to India's ambitions that are driving it towards the Gulf and central Asia. Benajir Bhutto the former prime minister of Pakistan said that Pakistan to should conduct the test, otherwise, India well go ached and adopts aggressive designs on us.

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The PRC said that India's nuclear tests would harm peace and stability in South Asia and she is "Seriously concerned" about the tests. The US was unhappy and said: "The US is deeply disappointed by the decision of the government of India to conduct nuclear tests. Mike McCurry, the US presidents spoke person said that "This runs counter to the effort the International community is making to promulgate a comprehensive ban on such testing". He further said that "The US intends to address its concern directly to New Delhi". He said that "We will continue to spare no effort in encouraging counters to both promulgate and ratify the comprehensive test ban. If anything this, tests underscore the importance of that international regime".

In India, the popular reaction was so positive. But, Praful Bidwai, a nuclear weapons analyst said that "China and Pakistan will regard us as a full-pledged nuclear adversary and so we will have two nuclear arms races a small one with Pakistan and a big one with China.

Nuclear weapons

In the 1990's or at the close of the century, India had stockpiled between 10 and 20 unassembled weapons which can be assembled at short notice and can be mounted on war planes or missiles**.** The available weapons are bombs, with 12 to 20 kt made with weapon grade. Plutonium and a Thermo nuclear bomb with a yield of 200-300 kg.

According to David Alfright, by the end of 1999, India had stockpiled between 240 and 395 kg of weapon grade Plutonium to produce weapons with the above stocks, 45 to 95 weapons can be produced. But India has nearly 4100 kg of Plutonium under IAEA control. With this, India can produce nearly 1000 nuclear weapons.

Nuclear weapons – India's options

India is neither a signatory not to the NPT or CTBT. But, it was in favour of partial Test Ban Treaty of October 1963. India is a member of the international Atomic Energy Agency (IA/EA). Out of 13 Nuclear reactors, four are under the IAEA safeguards India voted against the CTBT and MPT in 1996. India opposed it because there was no provision for nuclear disarmament within a time frame. India insists that treaty also bans laboratory simulations. India insists that the existing nuclear weapons in the possession of nuclear powers should be destroys otherwise, India will not sign such treaties which harm the interests Indian sovereignty.

With the Indian track record, the Western countries are convinced that the nuclear technologies intended to be used for peaceful purposes only. So, in 2006, the US agreed to supply civilian nuclear technology to India.

In conclusion, India with a humble beginning at Bombay, reached the stage of developing nuclear weapons, missile technology and long range. Brahmos India is capable to use this weapon by the Army, Navy and Air force. In four skirmishes between India and Pakistan i.e., 1948 trible invasion by Pakistan into Jammu and Kashmir, 1965, 1971 and 1999 Kargil war, India was not an aggressor. India is developing all the above mentioned nuclear war heads, in self defence and not intended to resort to aggression on other powers.

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